

Utility Patent Application of  
Stéphane Delisle for  
Flexible caterpillar belt and skis for a 4 x 6 utility vehicle

Cross Reference to Related Application

CA Patent Documents

2210818	Jul., 1997	Honda
2296781	Jan., 2000	Hugron

BACKGROUND OF THE INVENTION

Field of the invention

The present invention relates to the field of a 4x6 utility vehicle and is particularly concerned with an adapted equipment used to convert in a caterpillar tracted vehicle for winter use.

SUMMARY OF THE INVENTION

Caterpillar track vehicle are useful and manoeuvrable in different conditions such as winter season. The type of vehicle mentioned above is used in light maintenance work in a number of activity sector such as public parks, farms, building sites or else sports and it could be used for the transportation of equipments, workers, or for carrying heavy loads. But this type of vehicle equipped with pneumatic tires and with its low profile underneath frame is practically inoperative on snow-covered surfaces, ice and irregularity of the terrain and have for result to get the vehicle bogged down and because of this lack of performance during this period, owners of utility vehicle are resigned to put away for the winter season.

The present vehicle is designed to fulfil its functions only on hard bases or so and are useless in certain conditions like the winter season. This problem has been recognized in the past and owners of that type of vehicle are eager to find efficient solution, thereby, a so called utility vehicle is an essential tool for maintenance operations and gain in popularity. The so called utility vehicle is defined by a rear portion composed by a set of four wheels drive that propulse the vehicle and a front portion composed by a set of two wheels rotating freely on their axes is for the manoeuvrability. The only alternative proposed is the use of chained wheel traction mounted around each driving wheels. Although partly solving the problem of traction during the winter season such piece of equipment still suffer from a set of drawbacks. Indeed, in the case of switching from icy surfaces or compact snow bases to an abundant snow-covered soil, its unefficient traction will instantantly bog down the vehicle. Also, the

chained wheels traction vehicle are restrained to operate on potentially hard surfaces to conserve its manoeuvrability otherwise it will result of an abusive use of the mechanical portion.

During the normal use of the so called utility vehicle originally mounted with pneumatic tires and initially built to travel on hard soil have to restrain its use to a certain period of time over a year. The traction of the wheels itself is therefore compromised without substantial equipment. Eventually the needs for an extensive use of the vehicle throughout the winter season may be enable to function without appropriate equipment. Thus, the problem of having difficulty manoeuvring on snow with the vehicle still at least partially remains.

This problem has been recognized in the past and adressed to by CA patent 2,210,818 naming Honda Giken Kugyo Kabushiki as the inventor and CA patent 2,296,781 naming Hugron, Denis P. as the inventor. The prior arts only partially solve the problem of manoeuvrability in winter conditions. The proposed solutions suffer from various drawbacks including lack of precision in the conception of the guiding parts of the flat shape belt over round edge profiled tire, and the absence of skis under the front wheels of the so called utility vehicle leads to the persisting problem of the appropriate traction of both ends of the said vehicle.

Accordingly, there exists a need for an improved equipment which is especially adapted for a utility vehicle. Advantages of the present invention include the fact that the proposed equipment allows the vehicle to have a perfect tracking and a superior control on all winter surfaces and demand no modification of the original conception of the vehicle for the technical assembling of both caterpillar belt and skis using fast attachment device to be held in place. Also, the proposed components assembly are designed so as to be both economical and ergonomical. Furthermore, the proposed pieces of equipments are designed as to be both aesthetical pleasing and reliable.

## BRIEF DESCRIPTION OF THE DRAWINGS

An embodiment of the present invention will now be described, by way of example, in reference to the following drawings in which:

Figure 1, in an elevational view of the assembly, illustrates the caterpillar belt and ski in accordance with an embodiment of the present invention mounted on a conventional utility vehicle.

Figure 2, in an exploded view of the caterpillar belt assembly illustrated in relation with one pneumatic tire of the rear portion of the vehicle in accordance with an embodiment of the present invention.

Figure 3, in an elevational view and an upper cross sectional view of the cutting line I-I, of the ski assembly, illustrates in relation with one pneumatic tire of the front end of the vehicle in accordance with an embodiment of the present invention.

## DETAILED DESCRIPTION

Referring to figure 1, there is shown the caterpillar belts 18 and skis in aim to provide traction and superior control of a utility vehicle and related to a winter use in accordance with an embodiment of the present invention. The equipment 18, 8 are shown encompassed directly over the pneumatic tires A and B of a utility vehicle C. The illustration shows the fastening devices 13, 17 structurally assemble both the skis and the caterpillar belt over the wheels. The traction segment 1 profiled to match the shape of the pneumatic tires A and exert a free contact laterally of the side of these ones in manner to ensure both, the constant alignment of the caterpillar belt in movement around the pneumatic tires A and a grip of the whole contact surface of the traction segment 1 with the ground, the said traction segment is assembled in the outer surface of a belt 2 that encompass a set of two wheels. Each traction segment 1 beforehand perforated and secured in place with three bolts 3 of which heads 6 lay on fender washers 4 on the interior side of the belt and the three nuts 5 are inserted between the double edge 7 of the said traction segment to ensure the assembly compression. The pneumatic tires A make contact with the interior surface of the belt 2 and the bolts heads 6 insert the rubber threads 1A of the tires rumbling strips, what prevent the caterpillar belt to skid out the pneumatic tires A surface when operating. A fastening device 17 for rubber belt (not illustrated) are fixed and retained on each end of the belt 2 and linked with a removable rod what form a mobile and mechanical joint like a hinge. The details above describe and summerize the elements of the caterpillar belt.

The skis 8 complement of the invention illustrated in figure 3, which the pneumatic tires B take place in position inside the integral support 15 welded to the ski frame of which the rumbling strips of the said tires made a radial contact on the interior 16 of the support 15, the parallel shaped box ski 8 interior ensure the contact with the tires side B to be maintained on a lateral position. A fastening belt 12 held by axes 11 on the top of both front and rear of the support 15 and diametrically encompass the tires B and linked on the superior part of the said tires with a fastening device 14 to ensure the right tension and the locking of the mechanism. A double edge ski guides 9 is beforehand perforated and secured in place with bolts, washers and nuts 3-4-5 and longitudinally centered under the skis 8 as illustrated in the cutting line I-I of the figure 3 which the function is to intervene in the manoeuvrability of the vehicle C. To end the description the technical components of the skis of the figure 3, an ergonomical handle 10 positioned on the front end as to aim an easier handling of the front part of the vehicle C so far to free from an obstacle or anyelse necessary manipulation.